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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,963	03/11/2004	Nobutoshi Arai	0020-5237P	4006
2292	7590	07/13/2005		
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER SEFER, AHMED N	
			ART UNIT	PAPER NUMBER
			2826	
DATE MAILED: 07/13/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/796,963	Applicant(s) ARAI ET AL.	
	Examiner A. Sefer	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.  
 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.  
 4a) Of the above claim(s) 9-20 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-8 and 21-32 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment filed May 2, 2005 has been entered and new claims 24-32 have been added.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 31 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The application as originally filed does not specifically support the claim limitation "wherein a boundary is formed between an outer surface of the cover and the medium."

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 1-5, 8 and 26-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Muralidhar et al. ("Muralidhar") USPN 6,297,095.

Muralidhar discloses (figs.2-27 and col. 5, lines 26-46) a memory function body comprising: a first conductor 12/100 or silicon substrate (as in claim 8) and a second conductor 24; a medium 108/116 or silicon oxide/silicon nitride (as in claim 8) that is formed between the first conductor and the second conductor and made of a first material; at least one particle 104 that is formed in the medium and made of a third material; and a cover 106/107/112, formed within the medium, that covers the at least one particle and is made of a second material, wherein the second material being a material that functions as a barrier against passage of electric charges, and the third material being a material that has a function to retain electric charges.

As for claim 2, Muralidhar discloses (col. 17, lines 41-55 and col. 20, lines 20-60) the first material and the second material being different insulators, and the third material is a conductor.

As for claims 3 and 4, Muralidhar discloses the second material being a material obtained by making the third material insulative obtained by oxidizing or nitriding the third material (as in claim 4).

As for claim 5, Muralidhar discloses the first material being a silicon oxide or a silicon nitride, the second material is a semiconductor oxide, and the third material is a semiconductor.

Regarding claim 26, Muralidhar discloses the second material being silicon nitride and the third material being silicon.

Regarding claim 27, Muralidhar discloses (col. 18, lines 40-55) the medium having a thickness within the range recited in the claim.

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Regarding claim 28, Muralidhar discloses (col. 12, lines 50-55) said particle having a diameter within the range recited in the claim.

Regarding claim 29, Muralidhar discloses (col. 17, lines 41-55 and col. 20, lines 20-60) first, second and third material being different.

Regarding claim 30, Muralidhar's disclosure (col. 14, lines 11-19) could be utilized in a DRAM having a capacitor comprising the memory function body as recited above.

Regarding claim 31, as understood, Muralidhar discloses in fig. 27 a boundary 114 being formed between an outer surface of the cover and the medium.

Regarding claim 32, Muralidhar discloses said cover functioning as a barrier to prevent electric charges from passing to the medium.

6. Claims 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Muralidhar.

Muralidhar discloses (figs. 2-27 and col. 5, lines 26-46) a memory device or a memory circuit having memory devices (as in claim 22) or Electronic equipment including a semiconductor device including a memory circuit having memory devices (as in claim 23) including a field-effect type transistor that employs a memory function body comprising a first conductor 12/100 and a second conductor 24; a medium 108/116 that is formed between the first conductor and the second conductor and made of a first material; at least one particle 104 that is formed in the medium and made of a third material; and a cover 106/107/112, formed within the medium, that covers the at least one particle and is made of a second material, wherein the second material being a material that functions as a barrier against passage of electric charges, and the third material being a material that has a function to retain electric charges.

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6, 7, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muralidhar in view of Bawendi et al. ("Bawendi") US PG-Pub 2005/0072989.

Muralidhar discloses the device structure as recited in the claim, but lacks anticipation of an aluminum particle and oxide particle.

Bawendi discloses (figs. 1 and 2, pars. 0017, 0028-0029 and 0046) a memory function body comprising: a first conductor **SUBSTRATE** and a second conductor **GATE**; at least one particle 102 made of a third material; a cover (par. 0050), formed within a medium **FILM** and being made of a second material, that covers at least one particle; wherein the second material being aluminum oxide (listed as Group I-III-VI compounds in par. 0050) and the third material being made of aluminum (par. 0046) or gold (as in claim 24).

Therefore, in view of Bawendi's teachings, one having an ordinary skill in the art at the time the invention was made would be motivated to modify Muralidhar's device by incorporating an aluminum particle covered by aluminum oxide since that would improve the retention characteristics of the device as taught by Bawendi.

Regarding claim 25, Bawendi discloses (pars. 0029 and 0050) second material being silver oxide (listed as Group I-III-VI compounds) and the third material being made of the silver (listed as Group I-III-VI).

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***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

**NATHAN J. FLYNN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS  
July 6, 2005



NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800